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# IMMEDIATE INFERENCE AND THE DISTRIBUTION OF TERMS

IN the interpretation of exclusive and exceptive propositions there is a difficulty pertinent to the discussion carried on in this JOURNAL[1] by Professor Toohey and Professor Dotterer as to the distribution of the predicate in the partial inverse of affirmative propositions, and as to "immediate inference" and the distribution of terms in general.

The exceptive proposition offers a privileged example of how, in an actual situation within a limited universe of discourse, the partial inverse of a true proposition may well assert what is not true. *All but S is P*, we are told, is correctly expressed by the *A* proposition, *All non-S is P*; and from this is correctly derived *Some S is-not P*. It is agreed that we have no right to say *No S is P*; and examination of the meaning of *All but S is P* will convince, I believe, that strictly taken it need not express the situation from which alone *Some S is-not P* is justified. When Francis I wrote home "All is lost but honor," he undoubtedly meant that honor was not lost; and in general we should rightly hold the man who used exceptives to suggest what he knew to be untrue as at least not a model of truthfulness. Yet it must be admitted that, if Francis had lost honor as well as all else but preferred not to say so, he would have told, not the whole truth to be sure, yet not strictly an untruth; inasmuch as he had made no assertion about honor but had merely held it apart from the assertion he did make. And in fact, our exceptives frequently arise simply from ignorance which is properly recognized in the limitation of our judgment, or from a courteous, discreet, kindly, timid, or malicious reservation of statement. The conventional "present company excepted" is notoriously untrustworthy in any positive implication. Or let us agree that any triangle must be scalene, isosceles, or equilateral. Then to say "scalene triangles" is to say "all triangles except isosceles and equilateral triangles." And scalene triangles have three sides. Substituting the equivalent term, we may say "All triangles except isoceles and equilateral triangles have three sides" —and, if we had to discover the number of sides of triangles by inspection, we might well, after an examination only of scalene triangles, make this assertion; but it would be none the less false to say that some isosceles or equilateral triangles do not have three sides. In short, the exceptive proposition is a statement which is said to be correctly represented by a proposition from which is correctly derived a proposition which is not necessarily implied by the original statement. It appears, then, that either *All non-S is P* does not adequately and simply express the import of *All but S is P* or the process of inversion is in some cases illicit.

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[1] Vol. XVII, pp. 519–522; Vol. XVIII, pp. 320–326.

The case of the exclusive proposition is more illuminating; since here the untruth, though of precisely similar nature, may be taken as not the result of inversion, and in any case does not involve the inversion of an affirmative proposition. *None but S is P* is ordinarily represented, for syllogistic purposes, by *All P is S*; and the converse of this is *Some S is P*. If it be said that the exclusive is more properly represented by *No non-S is P,* then *All P is S* is the obverted converse, *Some S is P* the partial inverse. But here it is the partial inverse of an *E* proposition, and there is no infraction of the rules of distribution. The possible falsehood, however, remains as with exceptives; for *Some S is P* is frequently in actual cases not true. Admittedly we have no right to say *All S is P*; and since no assertion is made of *S*, wherein do we get the right to speak even of a part of *S*? Surely "No admittance except on business" ordinarily implies that some of those intent on business are admitted, but since other rules unnamed or other existing circumstances may well exclude all actual persons applying, we can not with strict assurance say that anyone is admitted. And this is not mere abstract quibbling, for the case is often actual because of ignorance, discretion, or the mere inadvisability of including all conditions in one proposition. I may offer a college course which is truly described as elective (none but those who elect it take it), and as open only to seniors (none but seniors take it); and if there is no senior, or no one who desires it, or no senior who desires it, it will be false to say that some who elect it take it or that some seniors take it. It might be quite true that only a mathematical genius can square the circle; it is certainly not true that some mathematical geniuses can square the circle. In short, it appears that either *No non-S is P* is not a perfect expression for *None but S is P,* or there is a loss of truth in obtaining the obverted converse of *E* (here, *All P is S*), or there is a loss in obtaining the converse of *A* (here, *Some S is P*).

In general it appears that by the use of accepted methods of interpretation we may from everyday assertions obtain propositions which are seen to be untrue or possibly untrue when referred to the actual situation from which the original assertion sprang and of which the original assertion is true. The error at times shows as a formal violation of the rule against going from an undistributed to a distributed term; but is broader and apparently not to be solved by a solution of the difficulty about distribution, since it appears where there is no evidence of that difficulty. It may further be noted that, inasmuch as the error is real, it directly impugns not the rule of distribution but the processes wherein that rule fails.

Now Dr. Keynes, whose doctrine as to the distribution of the predicate in the partial inverse of an *A* proposition Professor Dotterer seeks to amend and Professor Toohey rejects, seems to me at least to point the way to the solution of the problem, though not in his direct treatment of "validity of inversion" in the fourth edition of his *Formal Logic.* His discussion in the third edition seems to me the better, and the real clue to the larger problem is afforded by a footnote at the beginning of the chapter on *Immediate Inference.*[2] The usually accepted explanation is that of the fourth edition, according to which in inversion of *All S is P* we tacitly assume the premise *Some things are not P.* "The conclusion, *Some not-S is not P,* may accordingly be regarded as based on this premise combined with the explicit premise *All S is P;* and it will be observed that, in the additional premise, *P* is distributed."[3] Now the introduction of this assumed premise does seem to provide a proper distribution for *P*; yet, taken strictly, how does it act as premise? It can not be combined with the other premise in any possible syllogistic form to give the required conclusion. And if the mere presence of a distributed term in an assumed proposition gives us the right to distribute that term in the series of transformations of the proposition with which we are working, it gives us decidedly too much; for it would justify any distribution of that term and merely abrogate the rule of distribution altogether. We could go simply from *All S is P* to *All P is S.* Professor Dotterer is quite right in pointing out that the distribution of a term is not an absolute matter, but is relative to some other term or terms. Distribution is a property of terms "in syntax." We can not hunt around for any proposition in which a certain term is distributed, and then proceed blithely to distribute it in some other series of transformations. On the other hand Professor Toohey is quite right in maintaining that to make a term distributed or undistributed relatively to some one other term and to deny any pertinency to this distribution elsewhere is equally to take all value from distribution. Within any series of transformations of a proposition or within any true syllogistic series (propositions connected by competent middle terms), we have the right to speak of distribution or lack of distribution simply; but not as between unconnected propositions. A distributed term, that is, is distributed with regard to the other term in its proposition and to the other terms in other propositions connected therewith by distributed middle terms. An undistributed term is undistributed with regard to the other term in its proposition and to the other terms in other propositions connected therewith by middle terms, distributed or undistributed.

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[2] Keynes: *Formal Logic,* 4th ed., p. 126, n. 1; 3d ed., p. 93, n. 1.

[3] *Ibid.,* 4th ed., pp. 139 ff.

But this is not all. With regard to its own contradictory, and to at least some part of the contradictory of the other term in its proposition if that proposition is universal, any term is always distributed. For by the principle of contradiction the contradictory of any term is excluded from the whole of that term; and, since in all universal propositions at least some portion of the extension of the contradictory of the other term must coincide with some portion of that of the contradictory of the term in question, with regard to at least that portion of the contradictory of the other term the term in question will be distributed. But, of course, this is true only if there are contradictories to these terms. For if there be no contradictory to the term in question, then it will not necessarily be distributed with regard to any portion of the contradictory of the other term. And if there be no contradictory to the other term, it would be meaningless to assert distribution with regard to some portion of it. And this is why the assumption of the existence of the contradictory of the original predicate validates the partial inverse: not that we manufacture any premise therefrom, but that, if that contradictory exist, the term by its very nature will always be distributed with regard to it; and that obviously in the *A* proposition with which we start, if the contradictory of the predicate exist, then the subject must have a contradictory which in some part must coincide with the contradictory of the predicate; and with regard to that part the predicate will always be distributed—as it were by right of eminent domain. Now abstractly a contradictory can be made to any term; but actually, of course, we may have to deal with an all-inclusive genus, either absolutely or as an exhaustive species within some explicitly limited universe of discourse. The case, then, in the matter of the partial inverse is this. The explanation does not lie in any premise, but does lie in the assumption of the existence of the contradictory of the original predicate. For if that contradictory exist, then the predicate, being always distributed with regard to it, must also be distributed with regard to whatever portion of the contradictory of the original subject coincides with it; and somewhere within the same universe these two infinites must at least partially coincide. We have thus the right to say *Some not-S is not P,* since P must be distributed with regard to some portion of *not-S.* But actually we may have as predicate an exhaustive species which allows no existing contradictory, as if we say "All is lost but honor" when really there is nothing not lost. In such a case, going from "All things other than honor are lost" to "Some honor is not lost," we do go from a lack of distribution to distribution, and from truth to falsehood.

Now this is but an instance of the general principle given first by Dr. Keynes in the footnote already referred to. "We proceed on the assumption that each class represented by a simple term exists in the universe of discourse, while at the same time it does not exhaust that universe. This assumption appears always to have been made implicitly in the traditional treatment of logic."

It is that assumption, together with the acceptance of the logically prior principle of contradiction which necessitates the distribution of any term relatively to its contradictory, and together with the nature of the relations expressed in categorical propositions which through the principles of contradiction and excluded middle necessitates the coincidence of at least part of the contradictory of one term with at least part of the contradictory of the other term in all universal propositions, which validates the partial inverse of the universal affirmative proposition. And it is that assumption which is apt to give rise to error when the procedures based thereupon are applied to actual situations not conforming thereto; not only in the partial inverse of *A*, but, as we have seen with exclusive propositions, in the partial inverse of *E*, where the lack of conformity is in the assumption of the existence of the original predicate or of the contradictory of the subject; and, indeed, in other interpretations, even, conceivably, in so direct a one as limited conversion or simple conversion or simple obversion. The formal violation of the rule as to distribution is apparent in one case only, not because of any peculiar invalidity of the inversion of *A* propositions, but simply because for other reasons the partial inverse of *A* is the only case in which an originally undistributed term reappears distributed with regard to the contradictory of the other term; but there are several in which the contradictory of an originally undistributed term is distributed. And whence comes this right? From the fact, of course, that the contradictory of a term is necessarily distributed with regard to that term, and hence, in affirmative propositions, with regard also to at least part of the other term, and, in negative propositions, with regard to at least part of the contradictory of the other term. It is thus (with one exception, the full contrapositive, which will be noticed presently) that in the scheme of eduction contradictories will be found distributed. In general: Any term is distributed with regard to its contradictory and its contradictory with regard to it. When the term is put into a proposition, further results follow from this. In all universal propositions, the term will be distributed with regard to at least part of the contradictory of the other term. If the universal be affirmative, the subject will be distributed with regard to the whole of the contradictory of the predicate. In all affirmative propositions, the contradictory of the term will be distributed with regard to at least part of the other term. If the affirmative be universal, the contradictory of the predicate will be distributed with regard to the whole of the subject and will further be distributed with regard to at least part of the contradictory of the subject. (*Cf.* the full contrapositive, *All not-P is not-S.*) In all negative propositions, the contradictory of the term will be distributed with regard to at least part of the contradictory of the other term. An examination of the table of results of obversion and conversion will substantiate these *a priori* relations. In fact they are tacitly assumed in the principles of obversion and conversion, and, having once accepted these principles, we need not, so long as we correctly apply them, bother about particular distributions. But the whole structure rests upon the assumption that the terms have existence within the same universe of discourse and that neither exhausts that universe.

The really important question, then, is as to the justification for this assumption. This is not the place for a complete discussion of so profoundly reaching a question, but a few suggestions present themselves.

In the first place, it must be admitted that the lack of conformity is real and not negligible. In the fluency of our statements, we make many assertions taken as true relevant to a situation which rejects some formal transformations of those assertions. And it must be admitted that obversion and conversion need some more basic justification than a let-it-be-so. Yet this is not necessarily a condemnation of immediate inference nor an indictment of formal logic. We can not hope always to find a ready conformity between usage and principle. If logic insists on becoming complicated, it is therein not different from other sciences which attempt to conform to the wanton wiles of the actual. Much of the contemporary complaint against logic is really a complaint against the waywardness of language—the complaint that people refuse (for which, on other grounds, we owe thanks) to confine the opulence of expression to the pigeonholes of logicians. The formality of logic is of meaning, not of word; and all interpretation moves under the threat of material fallacy, whose generic nature is equivocation. Logic may well be complete and valid, despite the difficulties which expression makes for diagnosis.

The assumption that subject and predicate belong to the same universe of discourse we may readily allow as just. It flows from the very nature of judgment. It is true, of course, that sometimes, when we come to take contradictories for the purposes of obversion, we fall into error through an unwarranted limitation of one term with respect to the other; but even here the one universe is part of the other, and the error in extension is chargeable to faulty manipulation on our part, not to any defect in judgment. When, above, I used the illustration *All equilateral triangles have three sides; Some non-equilateral triangles have not three sides,* it was doubtless apparent that a more careful contradictory for the subject would have avoided the falsehood; yet the illustration there was proper, for, if both subject and predicate were reduced to the limited universe *triangles,* the falsehood would remain: *All equilateral triangles are three-sided triangles; Some non-equilateral triangles are not three-sided triangles.*

We may also, it seems, admit as just and necessary the assumption that the terms do not either exhaust the universe. This, however, is a necessity not of the essence of the judgment but of the essence of obversion; and, though obversion—negative statement—is too natural and proper a mode of expression to be discarded or seriously impaired by the chance of failure in limiting cases, we must recognize the essential shortcoming of the process. In absolute statements the limiting case is negligible; we do not often deal with completely exhaustive genus. The pinch comes because our actual statements so often have to do with artificial, delimited universes. And here, so long as our assertion is of definite, positive species, there is small danger; for, if one of the terms does exhaust the universe, we are apt to have our eyes open to it, or at any rate the derived statement will hide itself in the decent obscurity of an infinite term. But where our assertion begins with an indefinite negative, trouble arises; for that term reappears as a definite and positive term, and either we know it does not exist or, more usually, we know it does exist and infer from it a like existence for the other term which may not exist. So, from *All not-S is P,* we get the inverse forms *Some S is not P* and *Some S is not-P;* and, knowing the actual existence of the definite *S,* we ascribe equal existence to *not-P,* which, if *P* in the first place exhausted the universe, has no existence at all. This is the source of the peculiar liability of exclusive propositions to false interpretation. Even the contrapositives, which enjoy a somewhat privileged position as it were because of their kinship to the denial of the consequent, are vulnerable here.

If obversion lays itself open to actual error because of the assumption that the terms do not exhaust the universe, conversion runs foul of the more primary assumption of the existence of the terms. But it may be noted that this assumption involves less than at first appears, and for affirmative propositions at any rate may be pretty well justified. For it does not, of course, necessitate any special sort of existence, certainly not physical existence, for the terms; we can deal validly with propositions concerning chimeras, myths, abstractions; nor, further, does it necessitate even that the terms or either of them be in the original proposition thought in extension at all. All we need assume is that our terms have some meaning, and that whatever sort of existence is implied of one can be truly thought as inhering in the other within the same universe. And for affirmative categorical propositions this seems an easily justifiable assumption. If we accept the commonly accepted view that affirmative categoricals imply the denotative existence of their subjects, then, even though the predicate be thought primarily in pure intension, it must nevertheless be admitted as capable of extension at least so far as the proposition asserts coincidence of that intension with the extension of the subject. And if it be maintained that in any certain proposition both subject and predicate are in pure intension, then no difficulty will arise, since after conversion no different logical being can be asserted of either term than in the original proposition belonged to both. Two troubles, however, are found. In the psychology of understanding propositions, we commonly (and correctly) grasp the subject and then infer of the predicate at least potentially the same sort of existence we know the subject to have. It thus sometimes happens that, beginning with a proposition the subject of which has a limited sort of existence and the predicate of which is an attribute belonging not merely to the subject but to other subjects having much more complete existence, we arrive at a converse according to which we are tempted to extend to the new predicate the full-statured existence belonging to some other part of the extension of the new subject. But inasmuch as the converse of an affirmative is always particular, this error is always simply one of presumption on our part, not of illicit import in the conversion. The other danger arises from the frequency with which we express what are properly hypothetical judgments in categorical form. Here the partiality of the converse will not save us, for the reduction required—the shift in relation as we pass from that of subject to predicate to that of predicate to subject—is not a matter of quantity, from universal to particular, but is a matter of modality, from apodeictic to problematic. So it is with rules, mandatory and diagnostic. From the legend *No admittance except on business* I know that if someone is admitted he must be on business. Now perhaps I put this *All admitted persons are persons on business;*

but if I want to make *persons on business* the subject and tell what I know of them, I ought to say, not *Some business persons are admitted,* which will almost certainly be taken to mean more than I know, but *If someone is a business person, he may or may not be admitted.* For what I really know about the predicate is not that at least some of the class are also of the subject-class, but that at least I can not deny the subject of any member of the predicate class as such. When hypotheticals are put as categoricals, conversion, even by limitation, is an affirmation of the consequent—and inversion adds a denial of the antecedent.

As to negative propositions, the case is by no means so favorable. Even with respect to the reference of the terms to one universe there may be some hesitation. I should maintain, however, that negatives as well as affirmatives presuppose some community of relevance and in more than a barely formal sense. We may, to be sure, assent to the medieval denial of the triangularity of virtue, but any meaning which the proposition may achieve will depend upon the possibility of actual predication in some sense. To deny an attribute is to imply the significance of its possession. Our discussion of that part of the assumption which asserts that neither term exhausts the universe will also hold for negatives as well as affirmatives; though it may be noted that it is chiefly with negatives that actual usage belies the assumption, since our most frequent dealings with exhaustive species is when we deny of some subject an attribute which actually within the limited universe in mind does not exist—whose contradictory, that is, is actually exhaustive. Hence, again, the peculiar vulnerability of the exclusive proposition. Now this exhibits the real difficulty as to negative propositions: can we assume that subject and predicate have even by implication the same existential status? It appears that one of the commonest forms of negative judgment is the denial with respect to a subject thought in extension of a predicate taken purely in intension and actually having no existence within the universe of discourse. This lack of extensive implication is not, however, so facile as it seems at first sight; for the normal negative categorical directly and truthfully implies the coincidence with the subject of some measure of the contradictory of the predicate; even negatives, as we have seen, rest for their meaning upon some community of relevance between the terms; and the actual errors in negatives are once again a matter of restricted universes or of falsely put propositions. Still, negative propositions are especially prolific in interpretative error—error which practically arises chiefly in this way: a negative proposition, having for subject a negative, or "infinite," term and for predicate a term taken intensively only, eventually becomes a particular affirmative proposition, having for subject the contradictory of the original subject (that is, a definite extensive term) and for predicate the original intensive predicate. The truth of this depends upon the actual extensive existence of the original predicate, an existence which may be totally lacking. This once again points to the exclusive proposition. Beyond this, practical error is not apt to obtrude; since either the proposition remains negative, or the predicate falls into its contradictory.

One point already mentioned might be urged further in defense of the general assumption of obversion and conversion as regards negative propositions. It may be maintained that negatives which do not comply with that assumption are all properly not categorical but hypothetical. This, of course, is so to define the categorical proposition as to justify the traditional assumptions of "immediate inference"; but it may be supported on other and prior grounds, and, though it would mean a large and highly undesirable departure from the usages of language, it might be none the less necessary for theoretical rigor.

It should be noticed that, even if we make up our minds to this step, we are not saying, as has not seldom been said, that logic considers propositions as taken in pure extension. This doctrine would, of course, avoid many real difficulties; but it is not only extremely undesirable because of its divergence from usage but unnecessary for theory. We say merely that a proposition which has purely intensive import is properly hypothetical, and, if treated as categorical, may develop false implications. For how may a predicate, even of a negative proposition, be purely intensive—with no extensive implication? Only if the subject is really a condition not stated as fulfilled; only, that is, if the obverse and converse relations be problematic, not partial or contradictory.

To revert to the point of departure: it seems that if we accept the assumptions which Dr. Keynes names and which are implicit in the procedures of "immediate inference," those procedures are valid and without prejudice to the doctrine of the distribution of terms, subject or predicate. And if those assumptions be refused, the harm done is to "immediate inference," not to the doctrine of distribution. Nor does that doctrine itself involve the treatment of propositions in pure extension, much less any quantification of the predicate. It does, to be sure, imply that all terms in categoricals have at least the possibility of application, extensive or denotative; but all we need know in order to say a predicate is distributed is that, if it be taken as having application, the assertion made covers the whole extent thereof.[4] The distribution of terms, that is, is not a matter of the direct content of our judgment, but of what must be true of the situation to which our judgment is relevant; hence its basic methodological importance in real inference. Whether or not we distinguish between extension and denotation, and whatever the usage we adopt, are immaterial to this question of distribution. Whether we be speaking of the analysis of a genus into its species, or of the individual instances of a species, our term is distributed if our assertion is true of all the species or all the instances there are. If the term be singular, then in any assertion made of it it will be distributed, even though it have no extension in the sense of component species, since the assertion is taken as true of the only instance of the term there is.

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[4] *Cf.* Joseph: *An Introduction to Logic,* pp. 218 ff.

This brings me back to Professor Toohey's paper, and especially to one contention which seems to me to illustrate a very common and harmful confusion:

> There is an inconsistency in the logician treating the subject and predicate of a proposition as classes—an inconsistency which is masked by the ambiguity of the words *All* and *Some*. Each of these words may have a collective as well as a distributive force. . . . The rules of logic are based on the supposition that the subject term is used distributively, or at least that it is not used collectively. The words " distributed " and " undistributed " can not be applied to a term unless it is used distributively. In the proposition *All the angles of a triangle are less than two right angles,* the subject term, " angle of a triangle " is distributed; for it is used distributively. . . . But in the proposition *All the angles of a triangle are equal to two right angles,* no logician would speak of the subject term, " angle of a triangle," as either distributed or undistributed. Now when the subject and predicate of a proposition are considered as classes, the proposition can not convey any meaning unless both terms are interpreted in a collective sense, and if they are interpreted in this sense, the words " distributed " and " undistributed " can not be applied to them, any more than they can be applied to the subject of the proposition *All the angles of a triangle are equal to two right angles.* The words " collected " and " uncollected " would not be altogether inappropriate. If, then, the rules of logic presuppose that the subject is not used collectively, how can they be reconciled with a treatment of the proposition which imposes upon both subject and predicate a collective sense?

Now I am not anxious to defend the treatment of terms purely as classes, but I am interested to find a consistent usage for the words "collective" and "distributive," which seem to me to be involved in an evident confusion—especially in the text-books—which frequently interferes in the discussion of "distributed" and "undistributed," and which appears in the passage just quoted. I give the accepted doctrine from the text-book nearest at hand:

> A general term is a name which is capable of being applied to a whole group of objects. . . . A collective term, on the other hand, is a name applied to a number of individual things when taken together and treated as a whole, as an " audience," an " army." It is important to distinguish carefully between general and collective terms. A general term is a name which applies equally to

> each individual of the group; or, in other words, it is used of the individuals *distributively*. A collective name belongs to the whole, but not to the separate parts of the whole. Thus we say that " soldier " is a general name, and is used distributively of each man in a regiment. " Regiment," however, is a collective name for it applies only to the whole group, and not to the individual soldiers. Ambiguity sometimes arises from the fact that the English word " all " is used in both of these senses. . . .[5]

Fortunately text-books are seldom critically read; but even the uninferring sophomore, quite correctly in exegesis but most falsely in fact, is hereby persuaded that that there is a necessary alliance between "general term" and "distributive use," that no collective term can be used distributively, and that "general" and "collective" are contrasted and exclusive categories. Yet a moment's common-sense will tell us (as, indeed, often the books themselves inconsistently tell us) that the same term is frequently both general and collective, that if "distributive use" is to have any value at all it must be applied to collectives which alone can be used in any other way. And is "all" . . . "used in both of these senses"? Does "all" ever "apply equally to each individual member of the group"? The whole orthodox doctrine is sheer confusion on the one hand; between the individual members of a group of which the term is a name and the members of a group of which the term names the members, and on the other hand between distribution of meaning and distribution of predication. Let us simply say: Every term is either singular or general. Every term is either collective or not collective. These distinctions are independent and knowledge as to whether a term is singular or general tells us nothing as to whether it is collective or not. Further, in regard to the meaning of terms by themselves: Every term, singular or general, collective or not, distributes its meaning ("applies equally to each individual member of the group") to each member of any class of which it may be a member—*e.g.*, every table is a table; every Napoleon, Napoleon; every army, army. And no term, collective or not, distributes its meaning to each member of the class which it is or of which it is the name—*e.g.*, no soldier is a regiment ("regiment" never applies to "soldier"); no angle of a triangle is all the angles of a triangle. In regard to predication (terms in proposition): Any collective term may be used either distributively or collectively; *i.e.*, the predicate may be asserted of each member of the class or of the class as a whole. This is simply not pertinent to non-collectives, since only collectives represent a class.

Now the ambiguity of "all" is a matter of predication, not of meaning. We therefore agree that in logical propositions all quantity signs shall be used distributively. This is a mere convention for ease in handling plural quantity signs, which would otherwise, as collectives, be ambiguous. It is not a prescript to language, nor does it prevent our accurately representing statements which come to us with "all" or "some" otherwise used. And we can not say, as Professor Toohey and others say, that "the rules of logic are based on the supposition that the subject term is used distributively, or at least that it is not used collectively," so long as we separate, as Professor Toohey does, the quantity sign from the subject term. Collectives, singular and general, used collectively and used distributively, are constantly found in proper logical propositions. Nor can we say that "the words 'distributed' and 'undistributed' can not be applied to a term unless it is used distributively." Every "all" is not to be thought of as the propositional quantity sign and excluded from the subject. In Professor Toohey's example, *All the angles of a triangle are equal to two right angles,* "all" is not the quantity sign but an integral part of the subject term. "No logician would speak of the subject term, 'angle of a triangle,' as distributed or undistributed," because "angle of a triangle" is not the subject term; but "all the angles of a triangle" is the subject term, is collective, and is distributed. We have the same thing in *Any regiment is made up of soldiers;* where "regiment" is collective, general, used collectively, and distributed. In *Some regiments are clean-shaven* we have a general collective, used distributively, undistributed; in *The Fifth Maryland Regiment is famous,* we have a singular collective, used collectively, and distributed.

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[5] Creighton: *An Introductory Logic*, 4th ed., pp. 50 ff. The treatment here is decidedly better than in most texts.

The most fundamental of Professor Toohey's objections to the distribution of the predicate I can merely notice, inasmuch as it is aside from the question with which I have here been concerned, and as it involves final questions of the nature of logic. The objection is "that the use of the doctrine of the distribution of the predicate involves a vicious circle. . . . The logician . . . first calls upon the student's knowledge of the implication of propositions to prove the doctrine, and then he bids the student call upon his knowledge of the doctrine in order to find out the implication." Now formal logic, truly, is not an empirical science; yet no matter how *a priori* we make our construction of logical theory, it must appeal to experience to establish its appositeness to this world. And, moreover, it may be doubted whether we could achieve a logic at all did we not find for our analysis logical relations embodied in actual masses of judgment which we recognize as valid; and, at least in the process of learning and teaching, the appeal to justifying results is not only permissible but necessary. If this be argument in a circle, we shall have to make the best of it; since it is a circle from which no human thought can ever escape.

ALBERT L. HAMMOND.

JOHNS HOPKINS UNIVERSITY.

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## BOOK REVIEWS

*La Philosophie moderne depuis Bacon jusqu'à Leibniz: Études historiques.* GASTON SORTAIS. Paris: Lethielleux. 1920. Pp. x + 592.

At once ambitious and valuable is the series of works which Father Sortais is undertaking in these studies of the history of modern philosophy. If succeeding volumes are comparable to this first one in the series in fullness and explicitness of treatment, we shall have in the series a veritable encyclopaedia of seventeenth century philosophic thought—the century, of course, which created the atmosphere and formulated the problems of that epoch which is called "modern philosophy."

The first hundred pages of the near six hundred forming the volume are devoted to certain sixteenth century precursors of Francis Bacon who were concerned with questions of method and authority—Pierre Ramus, François Sanchez, Giacomo Acontio, Everard Digby, William Temple, Nicholas Hemmingsen—men who were feeling, in various lines, after philosophic and scientific methods which could lead them away from the sterile scholasticism of the period to a more natural and direct investigation of nature, and whose speculative work constitutes an interesting parallel to the series of scientific achievements which began with the theories of Copernicus. With this preparation Father Sortais goes forward to a study of the topic of his Livre I, which is *l'Empirisme en Angleterre et en France,* devoting the remainder of the present volume to a study of the life, work, and influence of Francis Bacon. As outlined in his general plan, this is to be followed by other books devoted to *Réactions que provoqua cette poussée empirique; Déisme;* the *Philosophie du Droit;* the *Révolution Cartésienne; Cartésianisme en France; Cartésianisme à l'étranger;* and finally, the *Systèmes plus ou moins opposés au Cartésianisme: Philosophie scolastique, Scepticisme, Panthéisme de Spinoza, Sensualisme de Locke, Dynamisme de Leibniz.* This is at once an heroic and a fascinating programme, in its very statement suggesting the dramatic turn which the author sees in the speculative effort of the century: first the thralldom of empirical and mathematical method, later the uneasy struggle of the mind to free itself from the too exclusive yoke of these